

LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA25 | Castle Bromwich and Bromford

Survey reports (CH-004-025)

Cultural heritage

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Department for Transport

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1 Introduction

1.1 Structure of the cultural heritage appendices

1.1.1 The cultural heritage appendices for the Castle Bromwich and Bromford (CFA025) comprise:

- baseline reports (Appendix CH-001-025);
- a gazetteer of heritage assets (Appendix CH-002-025);
- impact assessment (Appendix CH-003-025); and
- survey reports (this appendix).

1.1.2 Maps referred to throughout the cultural heritage appendices are contained in the Volume 5 cultural heritage map book.

1.2 Surveys undertaken

1.2.1 This appendix contains the results of extensive archaeological surveys undertaken. Key surveys reported in this appendix include:

- LiDAR survey of the majority of the construction area;
- hyperspectral survey of the majority of the construction area;
- geophysical surveys at two locations along the route encompassing 1.2 hectares; and
- aerial photographic survey of the majority of the construction area.

2 LiDAR survey report

2.1 Introduction

2.1.1 This report describes the results of the interpretation of LiDAR data that was undertaken to identify potential previously undiscovered archaeological assets within the study area. The methodology is described and the significance of the results is discussed.

2.2 Methodology

2.2.1 LiDAR data was analysed in order to identify previously unknown heritage assets that comprise an upstanding component (earthworks or ditches), and to supplement existing data for known heritage assets. The analysis was undertaken of 1m resolution Digital Elevation Model (DEM) data, using Esri ArcMAP 10.0. The data was visualised using ArcMAP's 'hillshade effect' function; the height ('z') data was exaggerated by a factor of 20 to assist in identifying features that may exist only as slight earthworks.

2.2.2 Interpretation was undertaken for the full extent of data available, including areas that lie outside of land required for construction; this enabled the features identified within the land required for construction to be examined within the context of the wider study area.

2.2.3 In order to have confidence that all notable features had been identified the data was subjected to simulated illumination. For this process the data was artificially lit from different directions and angles to highlight areas of archaeological potential. This process was undertaken as follows:

- Azimuth (direction of illumination): north, east, south, west, north east, south-east, south-west, north-west; and
- Altitude (angle of illumination): The data was illuminated at an angle of 45°, as this was found to be the optimum angle for identification of features. At angles less than or greater than 45°, features became increasingly less clear as the angle decreased or increased.

2.3 Limitations

2.3.1 Although the LiDAR data was received from HS2 at a resolution of 0.25m, data of this resolution could not be processed by the computers available; data was therefore processed at a resolution of 1m. While it is likely that ephemeral features may have been lost in this data conversion process, it is considered that the 1m resolution data was sufficient to identify the majority of features present.

2.3.2 Within the study area the predominant land use is urban/industrial and therefore archaeological features would not be evident. Within Park Hall nature reserve, the ground cover is scrub. This ground cover produces a response that is not as conducive to the identification of archaeological features as open pasture.

2.3.3 Any features identified by the review of LiDAR data are subjective and do not necessarily correspond to archaeological remains.

2.4 Assumptions

2.4.1 It is assumed that the data received from HS2 is correct and raw data was obtained according to current best practice.

2.5 Results

Interpretation of LiDAR data successfully identified 20 areas of interest within the study area. The sites are listed in Table 1.

Table 1: LiDAR survey - identified areas of interest from LiDAR interpretation

Unique identifier	Description	Feature number	Geographical location	NGR (site centred)
CBB078	Circular unknown feature	L1	North of Castle Bromwich Hall	E414031, N289940
CBB079	Ridge and furrow	L2	Castle Bromwich Hall	E413962, N289826
CBB080	Ridge and furrow	L3	Adjacent to Parkfield Drive	E414905, N290171
CBB081	Former river channel	L4	Between River Tame and Langley Hill Wood	E415212, N290667
CBB082	Ridge and furrow	L5	Between River Tame and Langley Hill Wood	E415266, N290613
CBB083	Ridge and furrow	L6	Between River Tame and Parkhill Wood	E415325, N290770
CBB084	Ridge and furrow	L7	Between River Tame and Parkhill Wood	E415648, N290833
CBB091	Trackway	L8	Between River Tame and Park Hall Wood	E416227, N291046
CBB048	Platform, site of Park Hall	L9	Between River Tame and Park Hall Wood	E415983, N290897
CBB086	Platform, Park Hall garden	L10	Between River Tame and Park Hall Wood	E416085, N290928
CBB087	Ridge and furrow	L11	Between River Tame and Park Hall Wood	E416148, N290969
CBB090	Drain/leat	L12	Between River Tame and Park Hall Wood	E416158, N290981
CBB097	Drain/leat	L13	Between Birmingham and Derby line and Park Hall Wood	E416448, N291094
CBB096	Drain/leat	L14	Between Birmingham and Derby line and Park Hall Wood	E416262, N290993
CBB092	Possible former water course	L15	Between Birmingham and Derby line and Park Hall Wood	E416301, N291111
CBB093	Drain/leat	L16	Between Birmingham and Derby line and Park Hall Wood	E416312, N291055
CBB095	Drain/leat	L17	Between Birmingham and Derby line and Park Hall Wood	E416372, N291098
CBB094	Ridge and furrow	L18	Between Birmingham and Derby line and Park Hall Wood	E416365, N291020
CBB089	Drain/leat	L19	Between Birmingham and Derby line and Park Hall Wood	E416172, N290936
CBB088	Drain/leat	L20	Between Birmingham and Derby line and Park Hall Wood	E416172, N290904

2.6 Description

Seven areas of ridge and furrow, seven possible drains or leats, two possible former river beds or water channels, one trackway, two building or structure platforms and one unidentified circular feature were identified within the LiDAR interpretation. All of the sites, with the exception of three, were located between the line of the M6 to the south and the River Tame to the north, within the former Park Hall estate. The remaining three were located in the environs of Castle Bromwich.

2.7 Interpretation

Within this study area the LiDAR data was able to confirm and further clarify known heritage assets, in particular, the site and environs of the former Park Hall. The study area is split into the surviving remnants of rural landscape in the eastern section around Park Hall nature reserve and the built-up industrialised area to the west; with the River Tame acting as a buffer separating the two areas. With the exception of a trackway, two building platforms and a circular feature, all of the identified assets reinforce the historic landscape interpretation of the area being agricultural and rural up until the 20th century when the continuing expansion of Birmingham caused the establishment of suburbs at Castle Bromwich and Bromford and a substantial increase in the industry in the study area.

The majority of the assets identified through LiDAR were located within the Park Hall estate with two platforms (L9, L10) identified in the location of the former Park Hall and in the area of the gardens. The remainder of the assets within this area provide further evidence of the agricultural history of this area, with five areas of ridge and furrow (L5, L6, L7, L18, L11) identified in the open area of land between the M6 and the River Tame. There is no further evidence for any landscape elements associated with an estate. For example, there is no trace of a boundary or park pale, or for any ornamental garden features or walks. A trackway (L8) was identified, possibly leading from the site of the hall to the entrance leading away to the east, but it is likely that many of the landscape features associated with the Park Hall estate have been removed or destroyed by the expansion of Castle Bromwich and the construction of the roads and rail network.

The LiDAR has also identified improvements made to the landscape and soils with the number of drains and leats shown in the eastern portion of the study area (L20, L19, L12, L16, L17, L14, L13). It is likely that this area was and still is quite marshy. Two possible water courses or channels (L15, L4) were identified within the Park Hall area with L4 being the course of the River Tame pre-canalisation. The excavation of drains to try and relieve this waterlogging would have enabled further land to be reclaimed and used for agriculture, thus improving the yield for the landowner.

To the south of the M6, near the site of the scheduled motte, a circular feature was identified (L1). This has not been identified and its function cannot be ascertained, however the proximity to Bromwich Castle could indicate an association.

Further remnants of the agricultural landscape survive to the south of the M6 in two areas of ridge and furrow (L2, L3) in land, which has remained undeveloped. L2 is located in close proximity to Castle Bromwich registered park and garden and may be associated with this

estate. The second area of ridge and furrow (L₃) is located in a buffer of land between Castle Bromwich and the M6.

2.8 Conclusion

- 2.8.1 All the features identified by the LiDAR interpretation are considered to be of local significance.
- 2.8.2 The LiDAR interpretation was successful in identifying archaeological features that were previously unknown, as well as providing clarity on known sites. It is interesting to note that outside of features associated with Park Hall, the prevalent feature type identified was ridge and furrow. While this feature type is well documented within the West Midlands, the areas of surviving ridge and furrow identified by the LiDAR are previously unknown.

2.9 Figures

- 2.9.1 Figure 1: LiDAR survey - Park Hall nature reserve



Figure 1: LiDAR survey - Park Hall nature reserve, red lines denote features identified

3 Hyperspectral survey report

3.1 Introduction

3.1.1 This report describes the results of the analysis of hyperspectral data that was undertaken to identify potential previously undiscovered archaeological assets within the study area. The methodology is described and the significance of the results is discussed.

3.2 Methodology

3.2.1 There is no standard methodology for assessing hyperspectral data. Data is acquired at a number of wavelengths, each of which has the potential to show the presence of buried archaeological remains. The technique relies on soils within archaeological features reflecting different wavelengths of light from the surrounding soil, however there is no way to determine the most effective wavelength without reviewing all available wavelengths, as all geologies possess different qualities.

3.2.2 The data received was divided into 34 'bands' with wavelengths ranging from 406.48 nm to 992.59 nm. The entire study area was reviewed for each of the 34 bands using ArcGIS 10, and where possible archaeological features were identified the outlines of these were marked as polygons as an ArcGIS shapefile.

3.3 Limitations

3.3.1 The technique has demonstrated itself to be appropriate to identifying potential archaeological features in ploughed fields; however in fields under crop, or scrubland, it appears that the technique is not effective.

3.3.2 Within the study area the predominant land use is urban/industrial and therefore archaeological features would not be evident. Within Park Hall nature reserve, the ground cover is scrub. This ground cover produces a response that is not as conducive to the identification of archaeological features as ploughed field or open pasture.

3.3.3 Any features identified by the review of hyperspectral data are subjective and do not necessarily correspond to archaeological remains.

3.4 Assumptions

3.4.1 It is assumed that the data received is accurate and is the most recent available for study.

3.5 Results

3.5.1 The review of hyperspectral data within this study area identified no potential archaeological features that were not known of previously. It is likely that this is due to the scrubland nature of the Park Hall nature reserve, which is not conducive to the technique.

3.6 Description

3.6.1 Due to the nature of the ground cover within the study area, the hyperspectral analysis was not able to identify any assets.

3.7 Interpretation

3.7.1 Due to no archaeological assets being identified, interpretation was not undertaken.

3.8 Conclusion

3.8.1 The review of the hyperspectral data was not able to identify any potential archaeological features within the study area. It is likely that this is due to the current scrubland ground cover in areas of the study area that are not urbanized.

4 Geophysical survey report

4.1 Introduction

4.1.1 Geophysical survey was conducted over two predefined areas at Park Hall Farm Nature reserve, referred to hereafter as 'Park Hall West' (NGR SP151905) and 'Park Hall East' (NGR SP160908). The aim of the survey was to locate and characterise any anomalies of possible archaeological interest within the study areas.

4.1.2 The two sites are within a parcel of land lying between the M6 and the River Tame, in the district of Birmingham (B). Park Hall West slopes down from south to north, levelling at its northern extents, and was largely overgrown with very long grass and dense weeds as well as a large number of trees of varying maturity. Park Hall East is predominantly flat but rises to the south in the eastern half of the site to meet an access track leading from the B4118 Birmingham Road. A large percentage of Park Hall East was inaccessible due to ponds, trees and bushes with the remainder comprising pasture.

4.1.3 Both sites lie on bedrock of Mercia Mudstone with superficial deposits of Head (clay, silt, sand and gravel) at Park Hall West and also alluvium at Park Hall East¹. The soils are classified as fine loamy and clayey deposits of the Salop (711m) association².

4.1.4 LiDAR data from Park Hall West shows evidence of ridge and furrow cultivation. Park Hall East is the site of Park Hall Farm, demolished in the 1960s, which occupied the site of a medieval manor house; part of a walled garden is still visible³.

4.1.5 The survey areas contain National Grid pylons and metal fencing whilst Park Hall East also has a BP pipeline running through the centre of it and a large metal stock feeder. These features produce large magnetic 'halos' which will extend some considerable distance beyond their physical footprint and mask any other responses from within that zone, thus precluding the collection of meaningful data.

4.2 Methodology

4.2.1 All survey grid positioning was carried out using Trimble R8 Real Time Kinematic (RTK) VRSNow equipment. The geophysical survey areas are georeferenced relative to the Ordnance Survey National Grid by tying in to local detail and corrected to the mapping provided by the client. These tie-ins are presented in Figure T1. Please refer to this diagram when re-establishing the grid or positioning trenches.

4.2.2 The magnetometer survey was carried out with Bartington Grad 601-2 fluxgate gradiometers, collecting data every 0.25m along traverses 1m apart. Data processing has been performed as appropriate using an in-house software package (GeoSub) employing the following processing steps: zero mean traverse, step correction (de-stagger) and interpolation (on the Y

axis). All survey work is carried out in accordance with the current English Heritage guidelines⁴.

4.2.3 Data are presented as greyscale and XY trace plots. The former allows simple feature identification and basic interpretation whilst the latter allows for analysis of the shape of the individual anomalies in order to better characterise the recorded responses.

4.3 Limitations

4.3.1 Magnetic survey is an exceedingly effective technique for site evaluation providing fast data acquisition and responding, to some degree, to the majority of archaeological site-types. The technique relies upon enhancement of naturally occurring iron-bearing compounds in the soil through anthropogenic activity. Detection rates can be poor where archaeological sites have only seen temporary and/or sporadic occupation or where there is insufficient activity to drive the enhancement; this is often true of Lithic-era sites. Success may also be limited over soils that are deficient in iron compounds, providing little material to be subject to enhancement. Conversely, the strength of response from soils and geological units which are naturally magnetic, for example igneous formations and soils derived thereof, may mask any subtler archaeological enhancement within.

4.3.2 The presence of ferrous structures either above or below ground (buildings, pylons, fences, pipes etc.) will produce very strong magnetic fields which will extend far beyond their physical footprint. The strength of these magnetic 'shadows' is such that it will mask practically any archaeological anomalies. Similarly, later features and demolition spreads or imported consolidation material can produce areas of magnetic disturbance that will mask underlying features.

4.3.3 As a general rule, the Bartington Grad601 instruments allow for a depth of investigation of approximately 1.0m, depending on the strength of the field produced by the buried feature; below this depth only particularly enhanced material will be detected with any kind of confidence.

4.3.4 At Park Hall West, only a limited area was surveyable due to very long grass, overgrown areas, brambles etc. Some minor positional errors will have been introduced during data collection through the longer grass which have been corrected for at the processing stage and not had a detrimental effect on the overall data quality.

4.3.5 The survey area at Park Hall East was also reduced, due to severely overgrown areas, a metal fence and a cattle feeder.

4.4 Assumptions

4.4.1 All of the fields contain small-scale ferrous anomalies, most clearly represented by sharp 'spikes' in the XY trace plots, and are typically assumed to be modern debris within the topsoil unless the site type or a priori knowledge suggests otherwise.

¹ BGS 2013, British Geological Survey, Geology of Britain Viewer, 1:50,000 scale geology, centred on 415540,290757; <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>; Accessed 08/07/2013

² SSEW (1983) Soils of England and Wales: Sheet 3 Midland and Western England. Soil Survey of England and Wales, Harpenden

³ Keyte, pers. Comm.

⁴ English Heritage (2008) Geophysical Survey in Archaeological Field Evaluation

4.5 Results

Description

Park Hall West

4.5.1 Isolated ferrous anomalies have been recorded across the site, with a cluster of them found in the south-west of the survey area. A broad positive magnetic response has been recorded on the southern edge of survey, towards the north, with negative responses around the north-eastern and north-western fringes of the survey.

Park Hall East

4.5.2 Survey was only possible in three areas at Park Hall East. The northern two survey blocks (Areas 1 and 2) have a strong linear ferrous response (with alternating positive and negative anomalies) running through the centre of them, the 'halo' from which has masked a large percentage of the survey grid. Further ferrous responses are visible in the north-western and north-eastern extents of Areas 1 and 2 with a second positive linear anomaly recorded in the Area 1.

4.5.3 The southern survey area has only a spread of ferrous anomalies, characterised by sharp peaks in the XY trace plots, with nothing else of note recorded.

4.6 Interpretation

Park Hall West

4.6.1 The isolated ferrous anomalies are assumed to be modern debris within the topsoil; the accumulation of such responses in the south-west may be imported material, dumped to consolidate ground near a gateway. The broad positive response is the edge of a magnetic 'halo' from a National Grid pylon, whilst negative responses along the survey edges are due to adjacent fencing.

4.6.2 The geophysical survey identified no anomalies of archaeological potential, and no additional heritage assets have been added to the baseline dataset as a result. Ridge and furrow was noted by the LiDAR analysis in this area, however this was not detected by the geophysical survey.

Park Hall East

4.6.3 The linear response with alternating positive and negative components in Areas 1 and 2 is characteristic of a metal pipe and, indeed, correlates with BP pipeline markers. The ferrous anomalies in the north-west of Area 2 are probably associated with demolition material originating from the Park Hall farm buildings, whilst similar responses in the north-east of Area 1 are on the modern river embankment and no doubt related to its construction.

4.6.4 The linear anomaly in Area 1 would appear to run between a mapped pond and the river embankment and therefore is likely to be a drain; the response looks too strong to be an archaeological ditch.

4.6.5 The small ferrous anomalies in the southern area are all assumed to be relatively modern ferrous debris within the topsoil.

4.6.6

Numerous assets related to the former Park Hall are known in this area, and are recorded on the HER, and noted by the LiDAR analysis. The geophysical survey results identified responses that may relate to demolition debris from the Hall; however the presence of a metal pipe within the survey area has limited the effectiveness of the geophysical survey to further elaborate on the known archaeology of the area.

4.7 Conclusion

Survey was limited at the Park Hall sites by dense vegetation and above ground ferrous structures. Where survey was possible, no anomalies deemed to be of an archaeological origin have been recorded, although there is some ferrous disturbance likely to be a result of the farm's demolition in the 1960s.

4.7.2

Isolated ferrous anomalies, assumed to be relatively modern debris within the topsoil, have been recorded at both sites. A pipeline has been recorded running through Park Hall East as well as what appears to be a drain between a pond and the river.

4.8 References

4.8.1 BGS 2013, British Geological Survey, Geology of Britain Viewer, 1:50,000 scale geology, centred on 415540,290757; <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>; Accessed 08/07/2013

4.8.2

English Heritage (2008) *Geophysical Survey in Archaeological Field Evaluation*

4.8.3

SSEW (1983) *Soils of England and Wales: Sheet 3 Midland and Western England*. Soil Survey of England and Wales, Harpenden

4.9 Figures

4.9.1 Figure 2: Geophysical survey - site location diagram, 1:50,000

4.9.2

Figure 3: Geophysical survey - location of survey areas, 1:3000

4.9.3

Figure 4: Geophysical survey - greyscale plot and interpretation - west, 1:1000

4.9.4

Figure 5: Geophysical survey - greyscale plot and interpretation - east, 1:1000

4.9.5

Figure 6: Geophysical survey - magnetic data - west, XY trace plot and greyscale plot, 1:1000

4.9.6

Figure 7: Geophysical survey - magnetic data - east, XY trace plot and greyscale plot, 1:1000

4.9.7

Figure 8: Geophysical survey - tie-in diagram, 1:1000

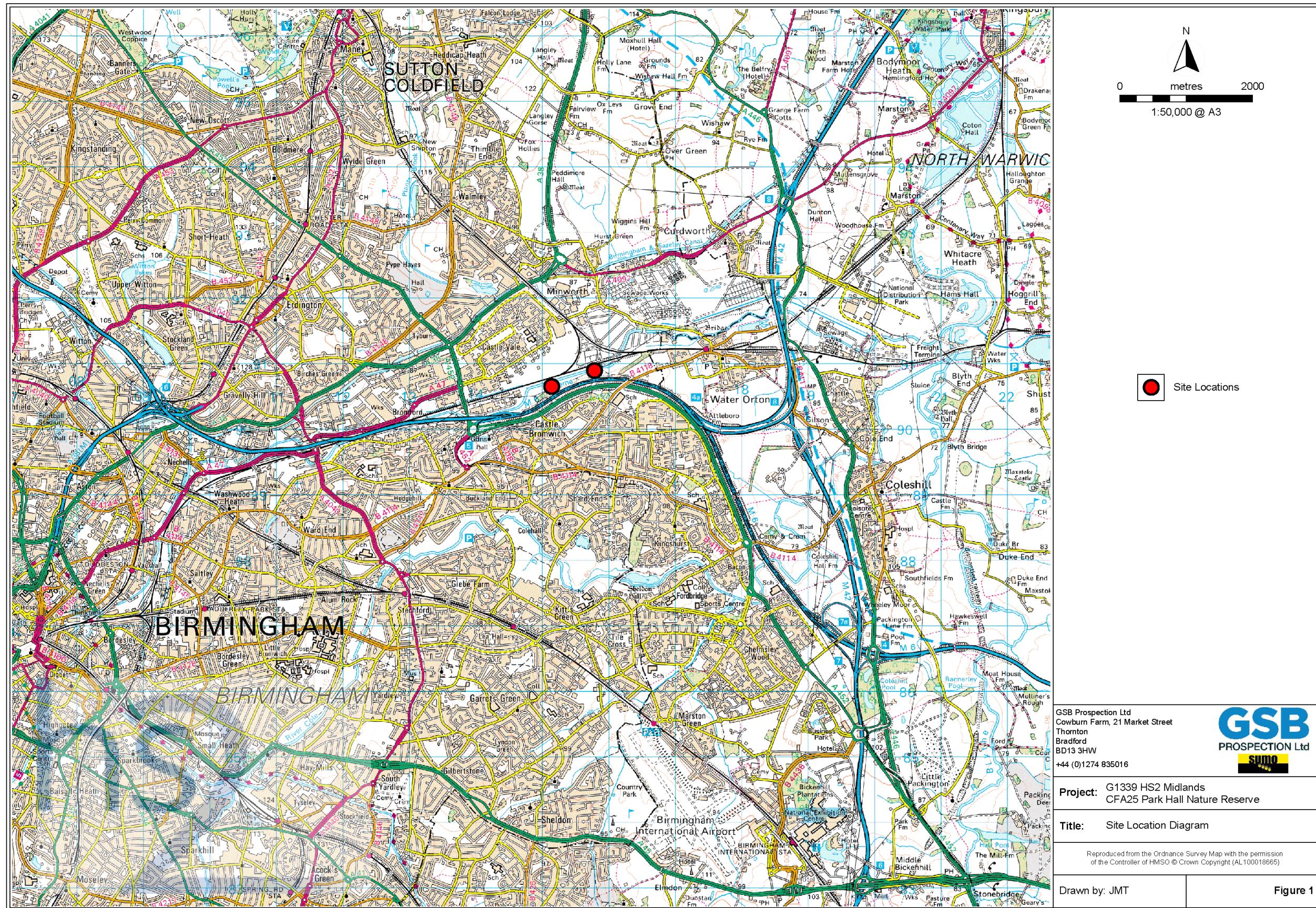


Figure 2: Geophysical survey - site location diagram, 1:50,000

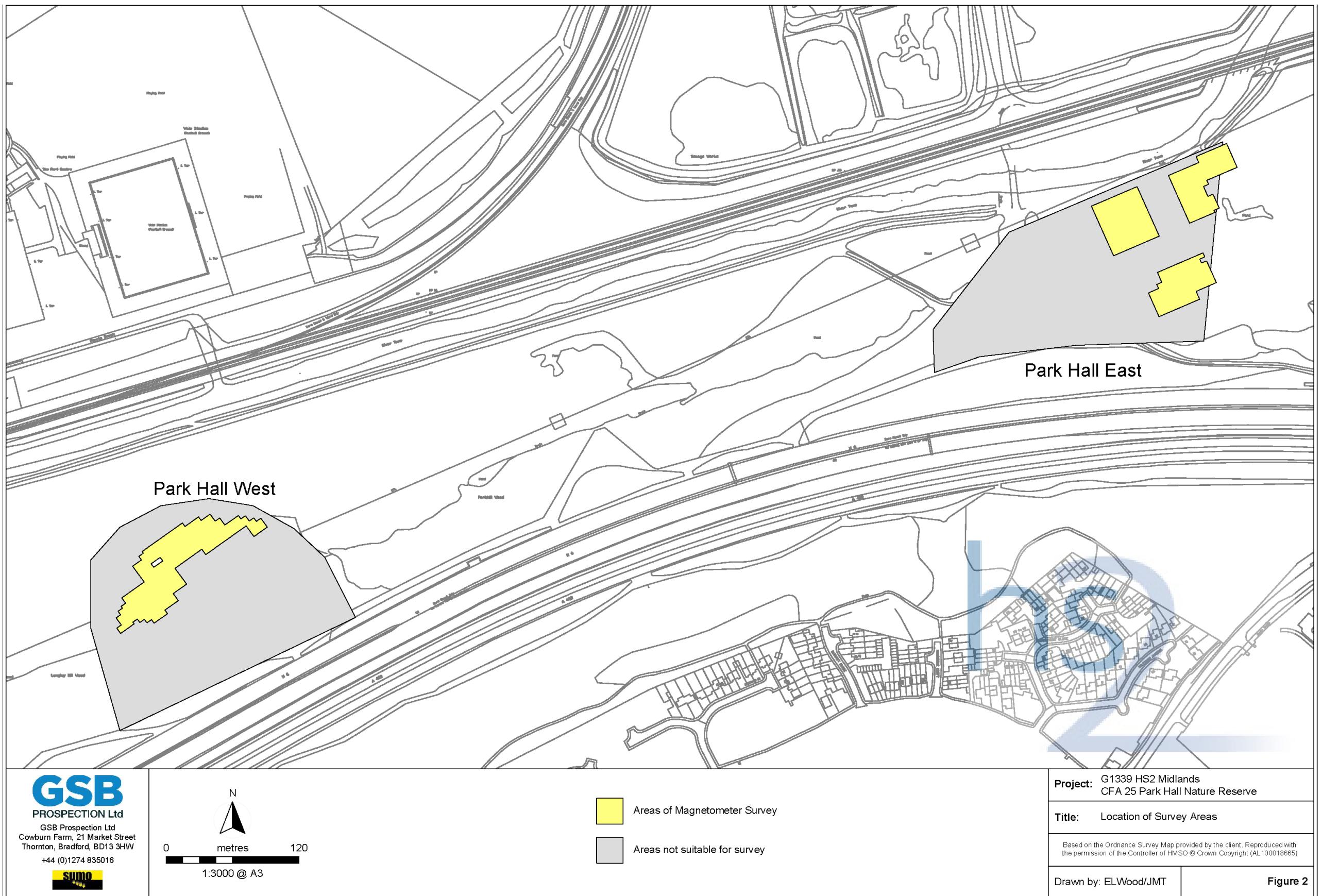


Figure 3: Geophysical survey - location of survey areas, 1:3000

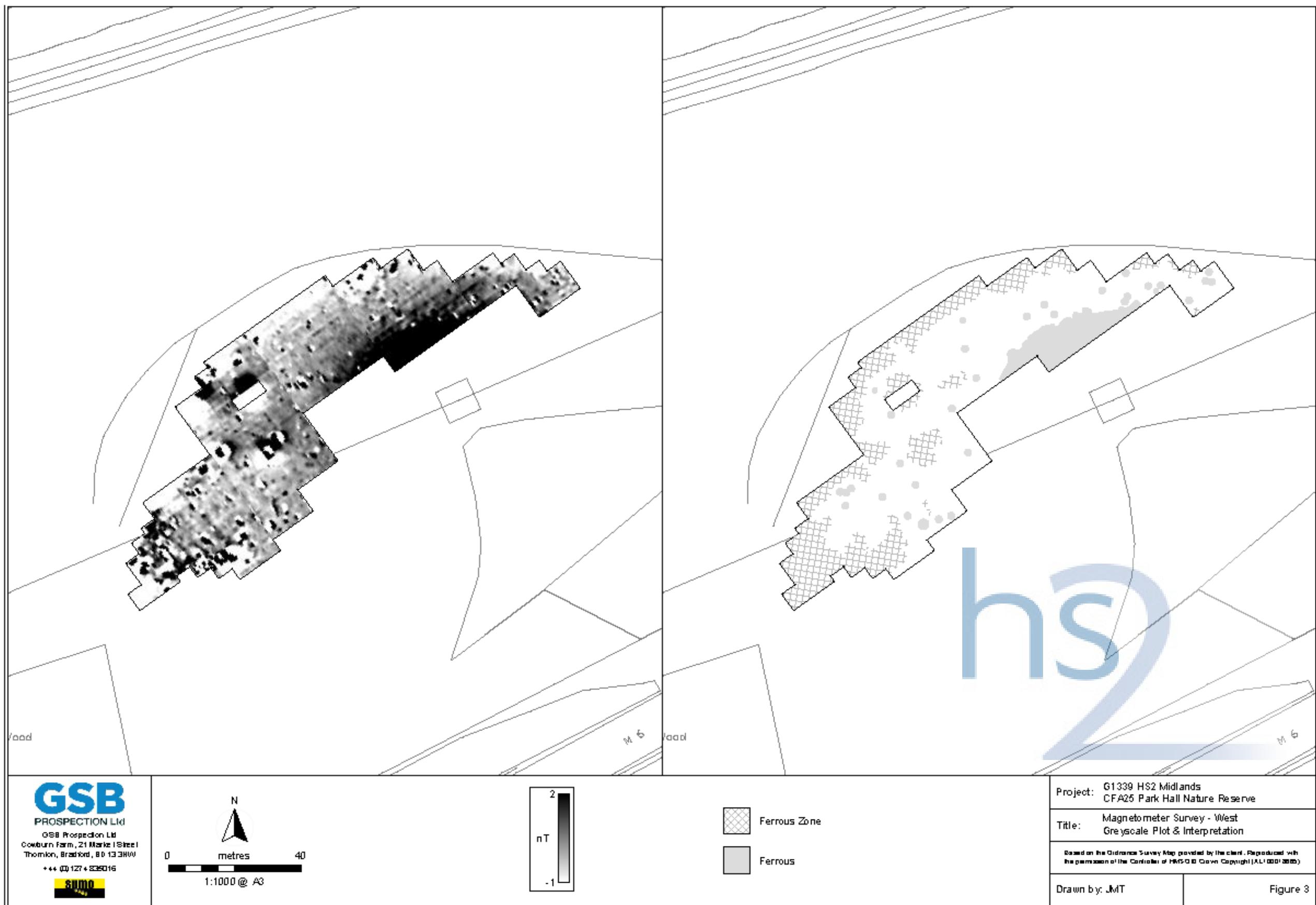


Figure 4: Geophysical survey - greyscale plot and interpretation - west, 1:1000

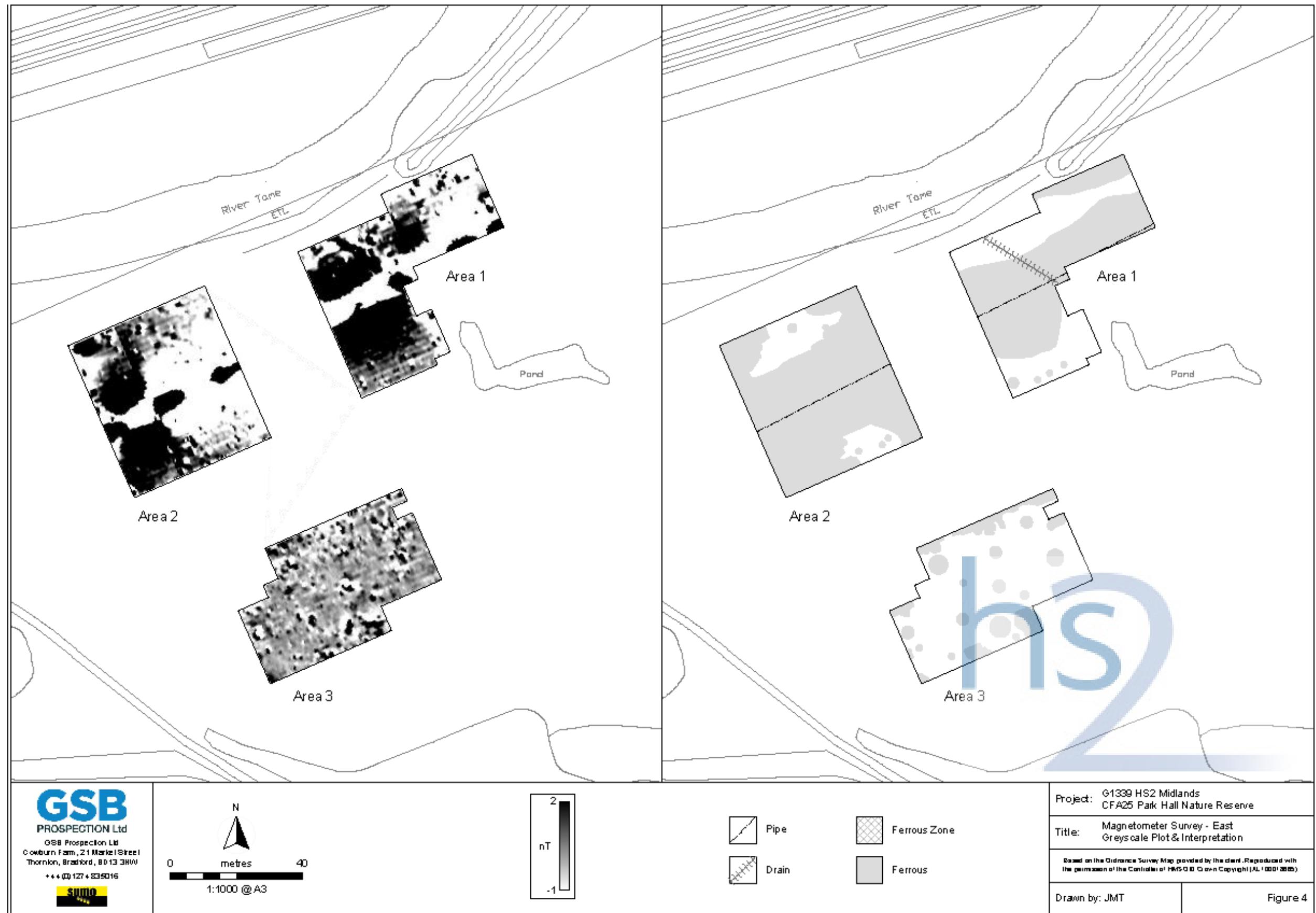


Figure 5: Geophysical survey - greyscale plot and interpretation - east, 1:1000

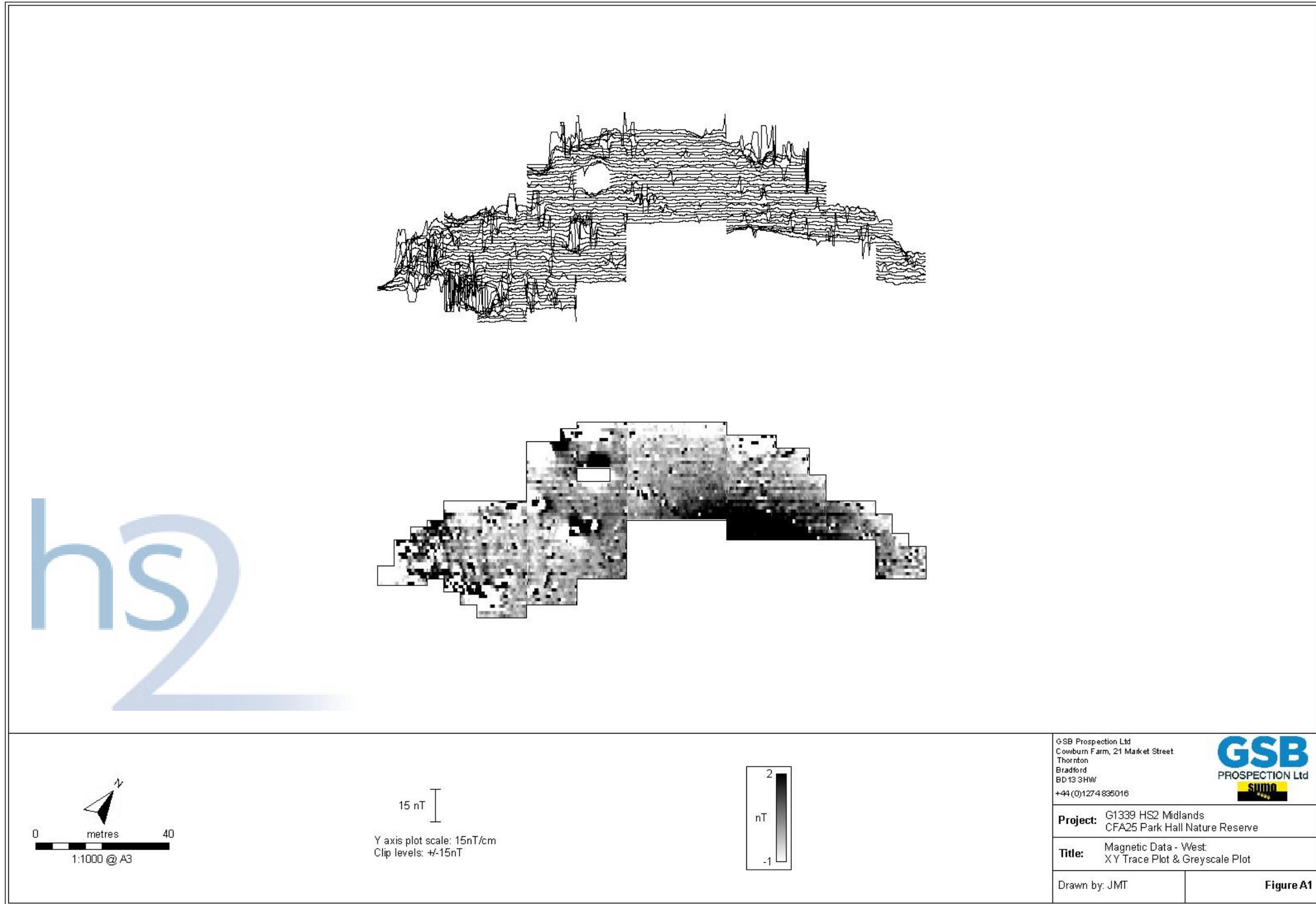


Figure 6: Geophysical survey - magnetic data - west, XY trace plot and greyscale plot, 1:1000

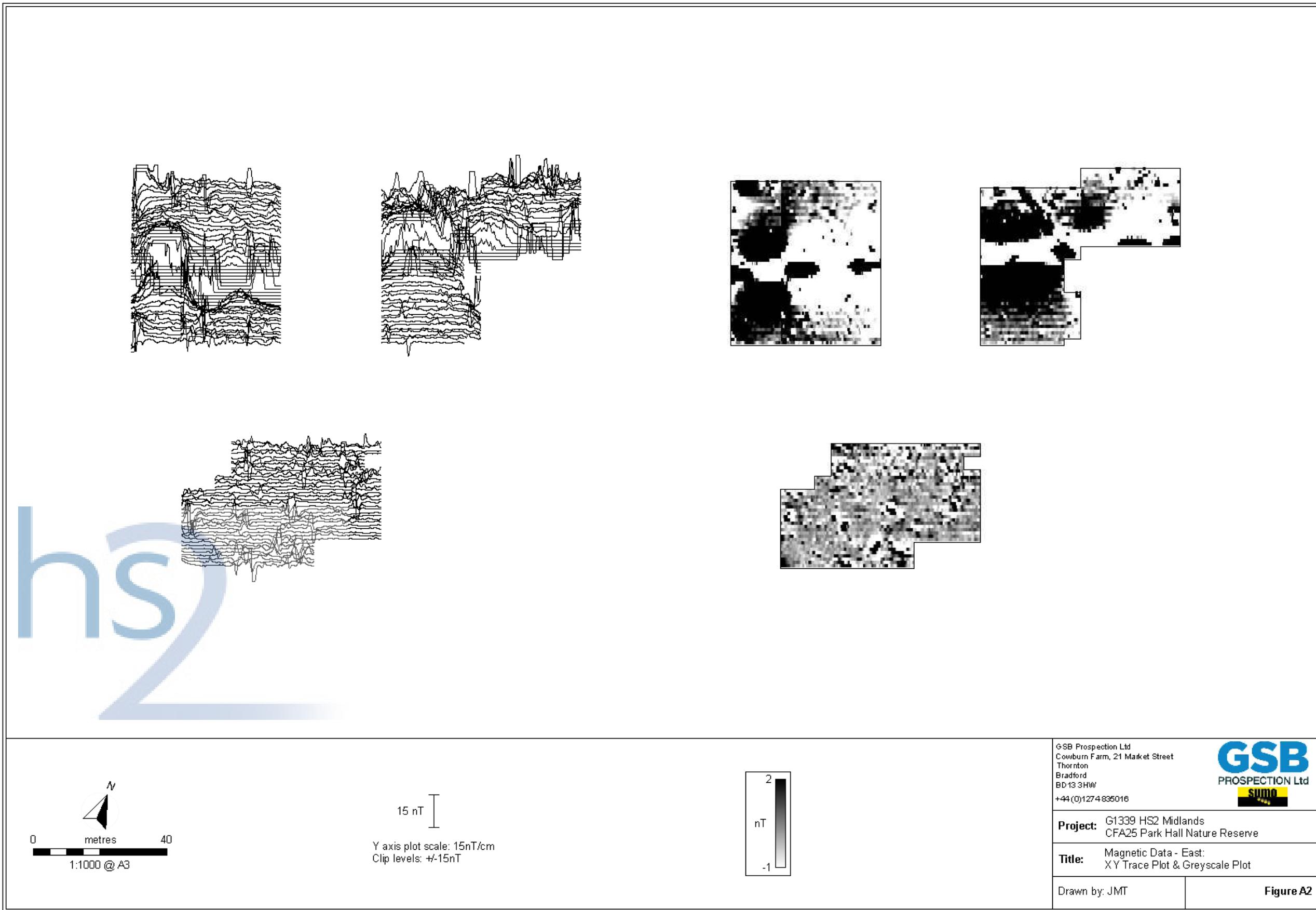


Figure 7: Geophysical survey - magnetic data - east, XY trace plot and greyscale plot, 1:1000



Figure 8: Geophysical survey - tie-in diagram, 1:1000

5 Aerial photographic survey report

5.1 Introduction

5.1.1 This report was prepared to support the assessment of cultural heritage assets that may be affected by the Proposed Scheme.

5.1.2 The object of this aerial photographic assessment was to provide information on the location, nature, condition and significance of archaeological sites and areas which are visible on aerial photographs within the study area (Figure 9). All periods from prehistory and historic were considered during the assessment. The assessment identifies areas where aerial photographs are of assistance in assessing the heritage potential of a site or area and facilitates determination of areas where more detailed mapping and analysis may be appropriate at a future stage of investigation.

5.1.3 Historical aerial photographs also highlight the past heritage assets of an area such as Castle Bromwich, where extensive development during the later 20th century has destroyed or partially obliterated remains of sites dating to previous periods.

5.1.4 All sites have been accurately located to a digital map base (Figure 10) to facilitate further investigation as appropriate.

5.1.5 Figure 9 shows the location of the study area.

5.1.6 The study area comprises c. 9km² of industrial, residential and open land within Bromford, Castle Bromwich and Water Orton in the West Midlands, UK.

5.1.7 The area is centred upon National Grid Reference (NGR) SP 150 910 and lies between 80 and 106m Above Ordnance Datum (AOD).

5.1.8 The study area has been heavily developed during the latter half of the 20th century, with the construction of the Castle Vale Estate and further post-war housing and industrial developments to either side of the M6 motorway, which bisects the area through the floodplain of the River Tame. There is some residual open land adjacent at Langley Hall, Park Hill and Park Hall Woods and arable fields between the M6 and Water Orton in the south-east of the area.

5.1.9 The Birmingham to Derby Railway line also traverses the area whilst the north-east sector is occupied by modern (post-war) sewage processing works.

5.1.10 To assist the reader table 2 provides a concordance between the assets number used in the Cultural Heritage section of Volume 2 and Appendices CH-001-025, CH-002-025 and CH-003-025 the asset numbering utilised by the compiler of this report.

Archaeology

5.1.11 The study area contains recorded heritage assets which may date from the prehistoric or Romano-British periods, with medieval farming, settlement, a moated site and a residual castle mound also in evidence. Castle Bromwich Hall and grounds are still extant, although the avenues of trees which formed part of their wider landscape are now built over or incorporated into modern development.

5.1.12 The former airfield at Castle Bromwich was established in 1914-15 and was used as a Spitfire testing and distribution centre during World War II (WWII). There were also some WWII defensive installations in the area as would be expected due to the proximity of the conurbation, airfield and associated factories.

The role of aerial photographic interpretation

5.1.13 Air photo interpretation provides an overview of landscape history, development and changes in land use. It provides informed guidance for subsequent desk and ground-based investigations and complements cartographic and documentary research. In this case it has identified a series of sites and allowed their precise location to inform future appropriate mitigation strategies.

5.1.14 Some information gained from aerial photographs cannot easily be detected by other means. Aerial photographs provide a chronologically documented and seasonal overview of a landscape and sites and features within it. The interpretation of contemporary and archival aerial photography is thus an important component of multi-disciplinary archaeological investigation.

5.1.15 Interpretation of aerial photographs allows the definition, and in some cases the accurate mapping, of archaeological sites or natural features recorded as crop, grass or vegetation marks (caused by the differential growth of plants over buried features); soil marks (caused by differences in soil colour over ploughed buried features), shadows cast by upstanding earthworks and features seen in relief and the assessments of assets which have been destroyed since the time of photography.

Types

5.1.16 Two types of aerial photograph are used for archaeological interpretation. Vertical aerial photographs are taken for general-purpose survey using a camera mounted inside a modified aircraft. The aircraft is flown on a pre-planned set of overlapping flight-lines which cover the survey area completely. The camera points straight towards the ground. The vertical viewpoint provides aerial photographic coverage from a fixed scale and constant 180° angles at the centre of each frame. The overlap between the areas covered by each consecutive frame is usually 60%. This overlap between frames enables the photo interpreter to study each pair of vertical photos under a stereoscope.

5.1.17 The stereoscope combines the two images to allow the interpreter to see one three-dimensional image of the ground surface. Vertical aerial photographs carry inherent distortions introduced by variations in perspective and ground height, but are essentially 'map-like' in appearance. They are generally taken for non-archaeological, civil and military purposes and form the basic data from which most modern maps are compiled. Vertical aerial photographs are a very useful source of archaeological data, particularly in areas such as this, where features survive as earthworks.

5.1.18 Oblique aerial photographs are taken using a hand held camera by an aerial archaeologist to portray features which have been identified during specialist survey. These photos are extremely useful, but contain inherent perspective distortions, which must be accounted for in rectification and mapping procedures. In this case, both vertical aerial photographs and specialist obliques, which are taken with a hand held camera by an archaeological surveyor,

5.1.19	were available for interpretation. The sources of aerial photographs used for this assessment are detailed below.	5.2.6	GIS layers reflect the types and conditions of sites which were recorded. These layers are colour coded, which may be changed if necessary to the project requirements.
	English Heritage archive	5.3	Limitations
5.1.19	English Heritage, The Engine House, Fire Fly Avenue, Swindon. Air photo enquiry number 78286. This enquiry identified 94 oblique aerial photographs and 508 vertical aerial photographs which were taken between 1922 and 2000.	5.3.1	It is important to note that aerial photographs usually only show part of the horizontal and vertical extent of buried and upstanding features. Their capacity to reveal features as crop marks, vegetation marks, soil marks or as the shadows cast by banks, ditches and walls, depends upon a number of environmental and agricultural factors prevalent at the time of the photographic survey ⁶ .
5.1.20	Cambridge University collection of aerial photographs (CUCAP)	5.3.2	Aerial photographic evidence is thus limited by seasonal, agricultural, meteorological, lighting and environmental factors which affect the extent to which either buried or upstanding archaeological features and structures can be detected.
5.1.20	Department of Geography, University of Cambridge. This collection contains vertical aerial photographs taken between 1983 and 2009 which were consulted in the CUCAP archive in Cambridge.	5.3.3	It is thus advantageous to examine a range of photos taken under a variety of environmental conditions in order to build up a comprehensive interpretation of the archaeological landscape. The visibility of archaeological features may differ from year to year and be obscured by differential depths of soil or differing types of vegetation, and individual photographs can often record only a small percentage of the actual extent of buried or upstanding features.
5.1.21	Online aerial images	5.3.4	These limitations are considered carefully whilst interpreting features from aerial photographs, and interpretations are built up from observations of many photographs, if available, over a range of instances of photography.
5.2.1	The ortho-rectified mosaics of vertical aerial photographs at Google Earth were consulted online for this assessment in May 2013 and included all available timelines from 1945 to 2011.	5.4	Assumptions
5.2	Methodology	5.4.1	All archives have been carefully searched and consulted and it is assumed that all, or the majority of, available aerial photographs held at the archives have been consulted and used for this assessment.
5.2.1	All photographs were interpreted in accordance with the client's brief for works and the Institute for Archaeologists (IfA) Technical Paper 12 ⁵ and current accepted best practise in accordance with the standards adopted by the English Heritage (EH) National Mapping Programme (NMP).	5.4.2	Assumptions have been made regarding the limitations of the data as outlined above, and any caveats on interpretations in the light of these limitations have been noted in the results section for each site.
5.2.2	The photographs were closely examined under 1.5x and 4x magnification and interpreted with the aid of a mirror stereoscope where appropriate, with the naked eye, or in detail on screen when consulted as digital files. All interpretations, which were derived from multiple aerial photographs, were transcribed to digital map bases as polygons and spot data to locate and identify them and may be digitally rectified to an Ordnance Survey (OS) map base using AirPhoto 3.58 software at a future date if appropriate as part of any further works.	5.5	Results
5.2.3	The printed map is presently scaled to fit the appropriate paper size (A3) for illustration, and it outlines areas which were defined during the project. Any specific alignments, such as the direction of former and extant ridge and furrow, are indicated by conventional lines and arrows as employed by the EH NMP.	5.5.1	The study area was photographed by Aerofilms in the 1920s and 1930s, and then by the Royal Air Force (RAF) between the 1940s and 1960s, after which it was photographed from the air by several commercial survey companies and the OS. Aerial archaeologist and former RAF pilot Jim Pickering also accessioned photographs to the EH archive he took in 1966 during the redevelopment of Castle Bromwich Airfield into the high rise estate at Castle Vale. These photographs provide an excellent overview of the changes from an open area to a modern urban settlement during the 20th century.
5.2.4	The mapping produced at this stage of the project is indicative of areas of potential, and may be refined at a later date to produce detailed transcriptions as appropriate to the requirements of the project.		
5.2.5	Mapping is also provided digitally for import to a Geographical Information System (GIS) in Drawing Exchange Format (DXF) release 12 and SHP files as a series of georeferenced digital layers.		

⁵ Palmer, R. and Cox, C. (1993) *Uses of Aerial photography in Archaeological Evaluations*, IfA Technical Paper 12. IfA Reading

⁶ Riley, D.N.R. (1980) *Early Landscape from the Air*. Sheffield
Wilson, D. R. (1982 and 2000) *Air Photo Interpretation for Archaeologists*. London and 2nd Ed 2000. Stroud

5.5.2 Within the study area, 22 individual polygons were defined which contain or contained heritage assets which are visible on aerial photographs taken between 1922 and 2011.

5.5.3 There is some very slight evidence for crop marked sites which could possibly date, or have dated, to the prehistoric or Romano-British periods at CB22 which is now destroyed and in the open areas of CB14. There is no visible trace of a burnt mound on aerial photographs at CBo6.

5.5.4 The majority of the sites in this area date to the medieval and post medieval periods. There is widespread evidence for medieval farming in areas which are still open land and also in areas which are now built over. Park Hall moat at CBo3 was visible on historic aerial photos as an eroded earthwork but is now built over by modern development.

5.5.5 There is no firm evidence for a deer park in the valley of the River Tame but post medieval drains and water meadows are still extant in parts of this area.

5.5.6 Castle Bromwich Hall and Gardens, CBo1, and the castle mound, CB18, are statutorily protected sites and are visible on aerial photographs. The avenues of trees which were once part of the landscaped area associated with the hall are now largely destroyed or incorporated to modern residential developments.

5.5.7 The area contained two heavy anti-aircraft batteries, CB10 and CB13, which were used to defend nearby factories and Castle Bromwich Airfield, CB14, in World War II (WWII). These sites are now destroyed and built over by modern development.

5.5.8 These areas are illustrated on Figure 10 and described in Table 2.

5.6 Description

5.6.1 Please see Table 2 for descriptions of the sites recorded with the study area.

5.7 Interpretation

Prehistoric periods

5.7.1 There were few traces of prehistoric occupation or land use visible on aerial photographs. A recorded possible burnt mound within the vicinity of CBo6 was not visible. One vertical aerial photograph, F21 543 RAF 1311 frame 023 showed some marks in crops at CB22, which now lies beneath the sewage works at the north-east corner of the study area. If extant, these would be identified as an area of archaeological potential as buried cut features of unknown, possible prehistoric, date. Some marks in the grass were seen on CB14, Castle Bromwich airfield. These are concomitant with its use to the mid-1950s as an operational airfield and possibly with some earlier land divisions and smaller features. These are discussed below as undated sites, but may have dated to the prehistoric periods.

Romano-British period

5.7.2 There were few traces of prehistoric occupation or land use visible on aerial photographs. A recorded possible burnt mound within the vicinity of CBo6 was not visible. One vertical aerial photograph, F21 543 RAF 1311 frame 023 showed some marks in crops at CB22, which now lies beneath the sewage works at the north-east corner of the study area. If extant, these would be identified as an area of archaeological potential as buried cut features of unknown, possible prehistoric, date. Some marks in the grass were seen on CB14, Castle Bromwich

airfield. These are concomitant with its use to the mid-1950s as an operational airfield and possibly with some earlier land divisions and smaller features. These are discussed below as undated sites, but may have dated to the prehistoric periods.

Early medieval period

5.7.3 There were no indications on aerial photographs of any sites or features which may date to the early medieval period.

Medieval period

5.7.4 The study area contained widespread evidence for the presence of eroded and some upstanding medieval ridge and furrow which indicated the areas which lay in the outfields of medieval settlements. These areas, CB 02, 06, 07, 08, 09, 11, 12, 16, 19, 20, and 21, which are now largely built over, have been recorded to show the extent of the former medieval farming landscape. There were no visible traces of a Deserted Medieval Village (DMV) at CB15 on aerial photographs. There are extant traces of ridge and furrow indicative of medieval fields at CB19, near Water Orton.

5.7.5 A moated site at Park Hall, CBo3, was visible as a sub-square light toned feature on RAF 541 213 frames 3098 and 3099. No traces of a manor house were seen and just the actual moat was visible as an eroded feature prior to residential development which destroyed this feature after the 1960s.

5.7.6 Ridge and furrow was also visible in the present grounds of Castle Bromwich Hall, CBo1. The Grade 1 listed hall and Grade II* listed gardens are extant. Two avenues of trees which extended to the west and south of the Hall, which were visible on historic aerial photographs, are now largely destroyed by modern development.

5.7.7 The residual mound (motte) of Castle Bromwich Castle, scheduled monument (SM) 1005906, is still visible as a reduced upstanding feature on aerial photographs on the flank of the modern M6 motorway at CB18.

Post-medieval period

5.7.8 Oblique aerial photographs taken in the 1920s and 1930s by Aerofilms and subsequent vertical aerial photographs show the previous extent of a series of drains alongside the River Tame at CB 04, 05, 06 and 08. These areas may have been used as water meadows. However, the typical patterns of drains and panes (small ridged and cut areas which retain water) were not visible in this area on aerial photographs. There is however, evidence for former river channels and hydrological control along the floodplain which is indicative of past management for possible grazing purposes within this alluvial land.

Modern Period

5.7.9 Castle Bromwich Airfield (CB14) was operational as a military and civil airfield between 1914/15 and the 1950s. Buildings recorded on aerial photographs taken in the 1940s, 50s and 60s were used as Spitfire aircraft testing facilities, factories and airfield buildings in WWII when the airfield was used for military purposes and the testing and distribution of RAF aircraft by female pilots.

5.7.10 Aerial photographs show the extent and use of the airfield and its buildings, and the progressive redevelopment of the area for residential use between the 1960s and 1990s. The only residual open areas are now used as sports or recreation fields in the south of this area.

5.7.11 The main body of the airfield showed several marks in the well-kept grass. Runways were not labelled with their landing directions during the 1940s and the appearance of the whole airfield is open but low key, presumably for camouflage purposes.

5.7.12 The airfield and its surrounding factories, some of which had painted camouflage on the roofs, were defended by two heavy anti-aircraft batteries, one to the south of the River at CB10 and one to the east of the airfield at CB13. These structures are no longer extant.

Undated features

5.7.13 An area of possible linear earthworks, CB17, may be natural or modern features, but their origin is uncertain. A crop marked site, which showed the location of some possible buried features at CB22, is also undated but is no longer extant as is built over by the modern sewage works.

5.7.14 Some of the linear marks seen within the grass on the former airfield at CB14 may have been associated with former, pre-airfield, boundaries and directional or other facilities on the airfield. Some marks in the south of the airfield may have been caused by fungus in the grass, whilst others are of unknown origin. The areas, which remain relatively undisturbed beneath open space, may possibly contain some buried features which pre date the airfield.

Conclusion

5.8.1 Historic aerial photographs taken since 1922 show that the study area has been heavily developed since the 1960s. Several areas of heritage interest have been destroyed since the 1960s and are now preserved only by record and thus of no present heritage significance.

5.8.2 There are possible areas in the south of CB14 (former Castle Bromwich Airfield, now Castle Vale residential area) which may contain or have contained buried pre-medieval features of unknown date and type, and some natural marks in the vegetation. These showed as grass marks on historic aerial photographs and their visible extents in the open ground are indicated on Figures 1 and 2.

5.8.3 Parts of the area were used for farming in the medieval period but there were no visible traces of medieval settlement at CB15. Residual extant ridge and furrow is present at CB19.

5.8.4 Aerial photographs show the extant part of the castle mound (CB18) and Castle Bromwich Hall and Gardens (CB01) in their modern settings.

5.8.5 A moated site, CB03, was visible as an eroded feature at Park Hall which is now built over. No traces of a deer park were seen on aerial photographs at Park Hall Wood.

5.8.6 There is evidence for water management in the floodplain of the River Tame which is likely to be residually extant in places as sub surface or very slight features. Residual traces of possible water meadows were visible on aerial photographs and are now possibly extant at parts of CB04, all of 06, 07, 08 and parts of 09 adjacent to the river, where some moderate potential for preservation in the top and sub soils is indicated in areas which remain as open ground.

5.8.7 There were military sites within the area in WWII, which are not now extant but are preserved by record on historic aerial photographs.

5.8.8 The area presents a modern industrialised, urbanised location with some residual medieval and post medieval features in constrained pockets of open land and a rich military history which is preserved by record. The statutorily protected remains of the Castle and Hall and Gardens are visible on aerial photographs within their much changed modern urban settings.

5.8.9 Further detailed mapping may be undertaken from historical and contemporary aerial photographs, if necessary to the requirements of any future ground works, to locate the very fragmentary but moderately significant grass marked remains in the south of CB14. Similarly, the possibly residual cut features at part of CB04, all of 06, 07, 08, part of 09, all of 17 and 19 may be mapped in detail if required from historical aerial photographs where they may remain in areas which are still under open ground.

5.8.10 Figure 11 indicates the significance of the sites identified from aerial photographs in terms of their current preservation and potential for preservation of archaeological deposits and/or other heritage assets and their potential heritage importance.

5.8.11 Assessment of significance has been based on the condition and preservation of the recorded features as evidenced by aerial photographs with consideration, where appropriate, for their statutory status if any.

5.8.12 Alterations to the significance of individual sites or areas may be appropriate in the light of the findings of the wider heritage assessment during the scoping process and of any required non-intrusive or intrusive assessments and evaluations which may be appropriate in the future.

5.8.13 Two extant sites, CB01 and 18 have been identified on aerial photographs. They are statutorily protected and of high significance.

5.8.14 Part of CB04, all of 06, 07, 08, part of 09, part of 14, all of 17 and 19 are still under open ground, or partially under open ground, which has not been significantly disturbed. They carry moderate significance for the preservation of buried deposits or extant features which may comprise parts of the relict past landscape, or slight upstanding remains of earthworks which comprise former landscape features.

5.8.15 CB02, 03, 04 (most of), 05, part of 09, all of 10, 11, 12, 13, part of 14, 15, 16, 20, 21, 22, which were identified on aerial photographs are now likely to have been destroyed by modern development. They carry no heritage significance beyond their contribution to the appreciation of the extent of the past landscape in this area. They are preserved by record via historic aerial photographs and in some cases reports on past investigations but are no longer extant, or are severely truncated, and were most likely destroyed by the foundations or landscaping of modern infrastructure during the 20th century.

5.9 References

- 5.9.1 1st Edition Ordnance Survey maps
- 5.9.2 Archaeological Solutions (2004) *Land at Water Orton, Birmingham Overhead Electricity Line Route, Phase 1, Non-Intrusive Archaeological Survey*. Archaeological Solutions Ltd report number 1678 on behalf of AMEC Earth and Environmental, UK, Ltd.
- 5.9.3 National Heritage Environment Record (NHER) and former National Monuments Record (NMR)
- 5.9.4 Palmer, R. and Cox, C. (1993) *Uses of Aerial photography in Archaeological Evaluations*, IfA Technical Paper 12. IfA Reading
- 5.9.5 Riley, D.N.R. (1980) *Early Landscape from the Air*. Sheffield
- 5.9.6 Soil Survey of England and Wales, *Sheet 3: Midland and Western England*, 1:250000 scale
- 5.9.7 Wilson, D. R. (1982 and 2000) *Air Photo Interpretation for Archaeologists*. London and 2nd Ed 2000. Stroud

5.10 Figures

- 5.10.1 Figure 9: Aerial photographic survey - the study area
- 5.10.2 Figure 10: Aerial photographic survey - sites recorded from aerial photographs
- 5.10.3 Figure 11: Aerial photographic survey - significance of sites recorded from aerial photographs

Table 2: Aerial photographic survey - all sites recorded within study area

Unique identifier	AP site	Site type	Period	NHER	NGR	Location	Present condition	Description	AP reference (s)
N/A	CB 01	House and garden	Medieval and post medieval	listed building [13556] Registered Park and Garden Grade II* [1000118]	SP 140 897	Castle Bromwich Hall and gardens.	Hall and gardens extant. Former tree avenues reduced. Ridge and furrow eroded.	Grade 1 listed building and Grade II* Registered Park and Garden. Castle Bromwich Hall and former ridge and furrow to its west and north-west. The ridge and furrow was upstanding in the 1940s. It is now eroded and was not visible clearly by 1985 although some is residual in the north of this site. There were two avenues of trees, one of which is now overbuilt and the other residual in the modern built environment which surrounds the hall and grounds. The southernmost tree avenue was residually extant in 2011 (Google Earth). This site is of high significance due to its designation.	Vertical RAF 541/213 CPE UK 2469 4127 - 4128 and all other verticals covering this area. RC8-HZ 177 and 178 RC8-JB 136 and 137 Oblique SP1489/2-4, 6, 13, 16, 17. Military oblique SP1389/2. All timelines Google Earth.
CBB024	CB 02	Medieval fields	Medieval	NA	SP 139 899	Between M6 and Castle Bromwich Hall.	Destroyed and built over.	Ridge and furrow was extant in 1931 and is now eroded and the area incorporated into a motorway junction layout. This site is of no, or very low, significance.	Oblique SP1490/1 Vertical RAF 541/213 100
CBB019	CB 03	Moat	Medieval	[332020] NMR SP19SE 6	SP 158 904	Park Hall, Castle Bromwich.	Destroyed by modern development.	Sub square eroded ditched enclosure which was a moat and site of a former manor house. The site of the moat was visible on aerial photographs as an earthwork during the 1940s and 1950s until it was built over after the 1960s. It is also depicted on Fowler's map of the area in 1833 and the 1886 1st Edition of the OS 1:10560 scale map and its later editions. This site is of no, or very low, significance.	Vertical RAF 541 213 3098 and 3099 RC8-HZ196 - 198
CBB05	CB 04	Water meadows	Post medieval	NA	SP 135 901	Bromford.	Eroded and built over. There may be vestigial traces of these features in areas of open ground but they are not visible on the latest APs (the 2011 timeline on Google Earth) and lie largely beneath the M6.	Area of former drains which indicate the possible presence of water meadows, which are now built over. The land here was open ground prior to the 1960s. APs taken in the 1920s, 1930s, 1940s and 1950s show the extent of likely areas of water meadows along the valley of the River Tame throughout the study area. These former features show well on the Aerofilms obliques from the 1920s and the 1940s RAF verticals, but any residual traces which may be present are not visible on modern aerial photographs. The majority of this site is of moderate significance, with a small part being of no, or very low, significance.	Vertical RAF CPE UK 2469 4127 and 4128, RAF 541 213 100-101 RC8-IG 281 and 282 RC8-IJ 31 and 32 Oblique SP 1390/4, 11SP 1490/2, 3, 4.
CBB073	CB 05	Water meadows	Post medieval	NA	SP 143 903	North of M6 and south of Castle Vale.	Destroyed by modern built environment and no longer extant.	Area of former drains which indicate the possible presence of water meadows which are now built over. Former areas of medieval ridge and furrow. The land here was open ground prior to the 1960s. APs taken in the 1920s, 1930s, 1940s and 1950s show the extent of likely areas of water meadows along the valley of the River Tame throughout the study area. Similar areas are recorded to the east of site 04, at AP sites CB 05, 06 and 09 along the floodplain. These features show well on the Aerofilms obliques which were taken in the 1920s and the 1940s RAF verticals. Aerial photographs taken in the 1940s and displayed on Google Earth (1945) show a series of works and linear striations on the site which indicate surface treatment and the possible construction of anti-glider defences on what was then a large area of open ground adjacent to the river and industrial buildings. This site is of no, or very low, significance.	Vertical RAF 541/213 3098 and 3099 RAF CPE UK 2469 4127 and 4128, RAF 541 213 100-101 Obliques SP 1390/4, 11SP 1490/2, 3, 4.

Unique identifier	AP site	Site type	Period	NHER	NGR	Location	Present condition	Description	AP reference (s)
CBB064	CB 06	Medieval fields and drains or water meadows	Medieval and post medieval	NA	SP 149 905	Langley Hill Wood.	Still open ground in 2011, no traces of former features are presently visible.	Area of ridge and furrow and former drains associated with water meadows. These features may be still extant below ground, but the modern land surface does not show any traces. The area is not built over and was open rough grassland adjacent to woods in 2011. A burnt mound was recorded here at SP 148 905 (cited as Birmingham Sites and Monuments Record oo639 – B12228 by Archaeological Solutions Ltd, 2004) but no firm evidence for this feature was recorded from the available aerial photographs. This site is of moderate significance.	Vertical RAF 541 213 3098-99 RC8-knCF 153
CBB005	CB 07	Medieval fields	Medieval	NA	SP 510 906	Langley Hill Wood.	Open ground in 2011, no traces of former features are visible.	Ridge and furrow was extant in the 1940s and 1950s but is now eroded. The area is not built over and was open rough grassland adjacent to woods in 2011. The ridge and furrow was eroded and not visible by 1987. This site is of moderate significance.	Vertical RAF 541 213 3098-99 RC8-IZ34 and 35
CBB003	CB 08	Drains, possible water meadows and medieval fields	Medieval and post medieval	NA	SP 160 910	Parkhill Wood.	Eroded ridge and furrow and drainage channels.	Former river channels, ridge and furrow and possible drains associated with water meadows. This area was a possible deer park, but no traces of this use have been identified on APs or during the Desk Based Assessment (DBA) which was undertaken by Archaeological Solutions (2004). No visible ridge and furrow is now present and the uneven ground in the area is likely to be associated with former river channels. This site is of moderate significance.	Vertical RAF 541 213 3098-99 OS 68 306 024 and 029 Google Earth timeline 2003 RC8-IG286 - 288 RC8-JB 7071 RC8-knCF 149
CBB017	CB 09	Medieval fields	Medieval	NA	SP 153 903	Castle Bromwich.	Mostly built over and destroyed but some vestigial in open ground.	Ridge and furrow. The ridge and furrow was eroded but still visible in 1985. This site is of moderate significance. This site is of no, or very low, significance.	Vertical F22 58RAF 1250 149-150 RC8-HZ196 - 198 RC8-JB 139 - 140
CBB036	CB 10	WWII military site	Modern	[1412848] NMR SP19SE 31	SP 159 905	Park Hall, Castle Bromwich.	Destroyed by modern development.	Former military site. Six small sub-circular embanked enclosures around a central enclosure. This site was a heavy anti-aircraft battery in WWII. This site is of no, or very low, significance.	Vertical RAF 541 213 3098-99 RC8-HZ196 and 197 RC8-IZ33 and 34
CBB024	CB 11	Medieval fields and WWII exploded bomb craters	Medieval and modern	NA	SP 138 900	Between Castle Bromwich Hall and the M6 motorway.	Destroyed by modern development.	Former residual ridge and furrow and WWII bomb craters. There were other exploded bomb craters to the SE of this site which are now built over. No further evidence was found on photographs held at CUCAP. This site is of no, or very low, significance.	Vertical RAF 541 213 3100 RC8-IG 284 - 286 RC8-IZ 34 and 35
CBB052	CB 12	Medieval fields	Medieval	NA	SP 156 897	West of Castle Bromwich Hall.	Destroyed by modern development.	Former ridge and furrow. This site is of no, or very low, significance.	Vertical RAF 541/213 100
CBB085	CB 13	WWII military site	Modern	[1412851] NMR SP19SE 30	SP 154 918	East of Castle Vale.	Destroyed by modern development.	Former WWII military site, similar to CB10. Small sub-circular embanked enclosures around a central enclosure. This was a WWII heavy anti-aircraft battery. The site was still visible in the last stages of erosion prior to development 1985. This site is of no, or very low, significance.	Verticals 541 213 4097, F21 58 RAF 1250 0084 RC8-IB 52,3

Unique identifier	AP site	Site type	Period	NHER	NGR	Location	Present condition	Description	AP reference (s)
CBBo16	CB 14	Airfield and military WWII factories Undated former boundaries and undated buried features as marks in grass on former airfield	Modern Undated	[1390858] NMR SP19SW 30 [1390889] NMR SP19SE 29 [1412840]	SP 145 913	Castle Bromwich Airfield Castle Bromwich Airfield, former Aircraft test house. Former WWII shadow factory for aircraft production	All destroyed by modern development.	Former site of Castle Bromwich Airfield. Former airfield. Hangars, unmarked runways, aeroplanes and buildings with camouflaged roofs visible in the 1940s, and still in use with marked runways in 1953. The area is very open and flat and the grass closely mown. There were many features visible as marks in the grass, some of which were likely to have been pre modern. There was a circular cut feature and some linear and curvilinear possible enclosures or boundaries, alongside some natural fungus marks and some possible small sub circular enclosures in the south of the area. The land here is still open and laid to grass as playing fields. The antiquity or nature of these features is not known, and they are largely now destroyed below the buildings. This site was under Castle Vale development by 1966, and was invisible on all photos post-development. The shadow testing factory was finally demolished in the 1990s. This site is of moderate significance.	Verticals F21 RAF 1545 0027V82 RAF 779 pt 1 0028 – 32, RAF 541 213 4098 – 4100 RC8-HZ290 and 291 RC8-IG 281 Redevelopment recorded on obliques SP1491/1 and 2.
N/A	CB 15	Site of Deserted Medieval Village (DMV)	Medieval	[332079] SP19SE 17	SP 167 904	Site of Bosworth DMV.	Not seen on older aerial photos and site is now destroyed by modern development.	The NHER records the possible site of Bosworth DMV at this location. It is wooded and there are no traces on any of the aerial photographs of the remains of a DMV, which are likely to have been destroyed. This site is of no, or very low, significance.	NA
CBBo02	CB 16	Medieval fields	Medieval	NA	SP 160 920	Castle Vale Sewage works.	Destroyed by modern development.	Ridge and furrow which was extant prior to the development of the sewage works at this location. This site is of no, or very low, significance.	Vertical F21 58 RAF 1250 0082 and 0083 RC8-IB54 and 55 RC8-IB 65 and 66 RC8-JB 8 and 9
CBBog8	CB 17	Undated earthworks possibly modern	Undated	NA	SP 149 893	Castle Bromwich.	Not now visible, but under open ground.	Slight linear earthworks and a circular feature, which could have been modern or post medieval features. These are not now apparent although the area is still under grass. This site is of moderate significance.	Vertical F21 58 RAF 1250 153 and 154 RC8-knCF 149
N/A	CB 18	Castle mound (motte)	Medieval	SM 1005906 [32117] NMR SP19SW 8	SP 142 900	Bromwich Castle.	Eroded but still partially extant scheduled monument.	Castle mound (motte) extant but eroded alongside the M6. A reduced and eroded motte remains at the site, which was less eroded in the 1940s. There are faint marks in the grass which indicate surrounding features. This is a statutorily protected monument, and remains extant in the grass at the junction of the M6. Its previous setting and extent is recorded on 1940s aerial photographs. This site is of high significance due to its designation.	Vertical F22 58 RAF 1250 153 – 154 RC8-JB 136 - 138
N/A	CB 19	Medieval fields	Medieval	NA	SP 173 908	Water Orton.	Extant.	Ridge and furrow extant as residual earthworks in grass. This site is of moderate significance.	Vertical F22 543 RAF 1311 0233 Google earth all timelines. RC8-knCF 151 RC8-IG 289 and 290

Unique identifier	AP site	Site type	Period	NHER	NGR	Location	Present condition	Description	AP reference (s)
N/A	CB 20	Medieval fields	Medieval	NA	SP 167 902	Castle Bromwich.	Destroyed by modern development.	Former area of ridge and furrow seen as marks in grass prior to development. This site is of no, or very low, significance.	Vertical F22 RAF 1554 0020 RC8-JB 141
CBBoo1	CB 21	Medieval fields	Medieval	NA	SP 160 902	Castle Bromwich.	Destroyed by modern development.	Former area of ridge and furrow. This site is of no, or very low, significance.	Vertical F22 58 5541 023 RC8-IZ136 and 137 RC8-IZ 187
CBB077	CB 22	Buried features as crop marks	Undated	NA	SP 169 922	Castle Vale Sewage Works.	Destroyed by modern development.	Prior to development as a sewage works, this area showed some marks in crops which may have indicated a complex of buried ditched enclosures, which have subsequently been destroyed by development of the sewage works. This site is of no, or very low, significance.	Vertical F21 543 RAF 1311 0233 RC8-FN 017

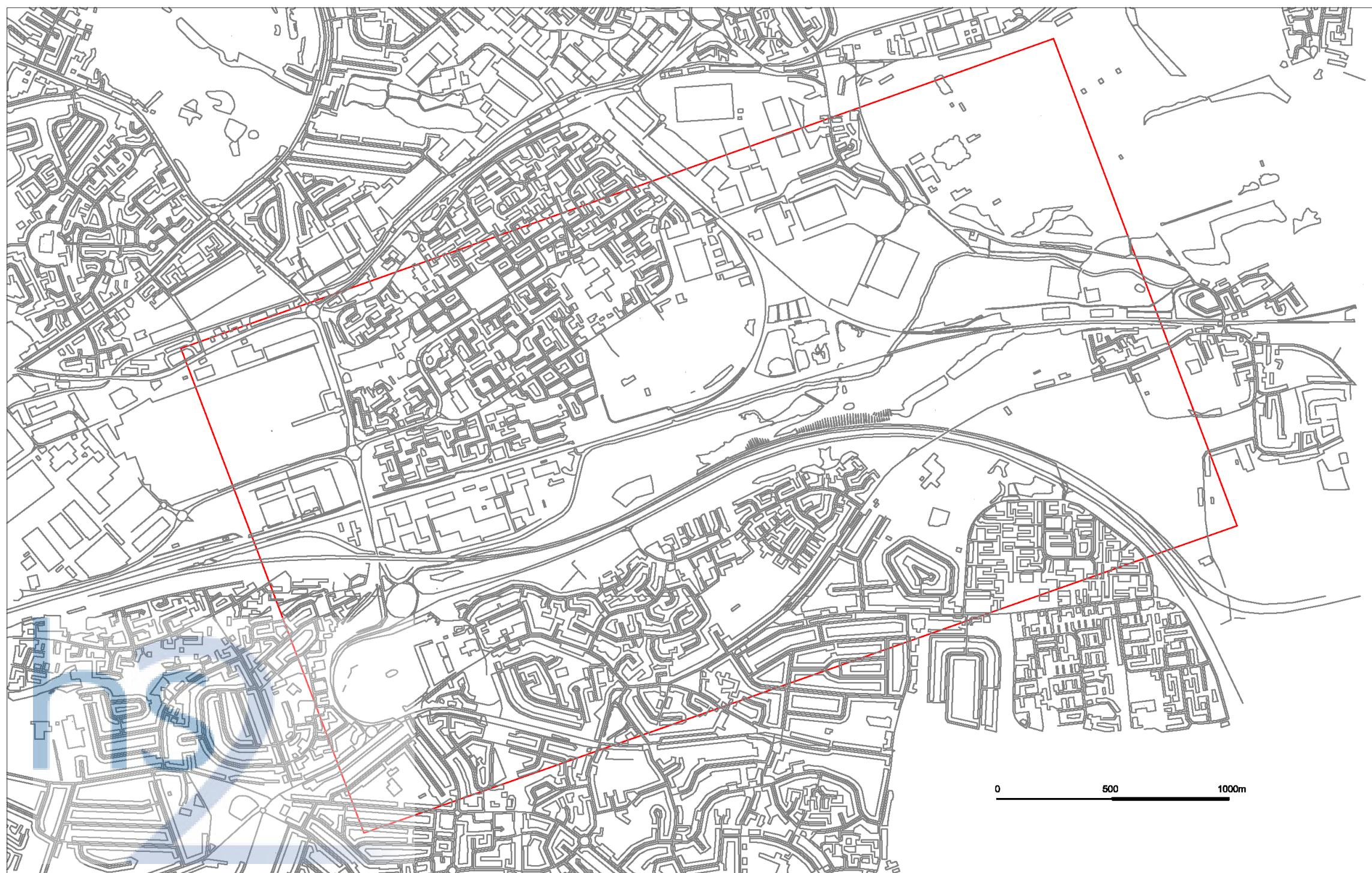


Figure 1 The Study Area

Legend

Project 213 0401/1 West Midlands API CASTLE BROMWICH
Client Ove Arup & Partners Ltd.
Date 23 06 2013
Scale As marked, for information only
 Air Photo Services Ltd. www.airphotoservices.co.uk

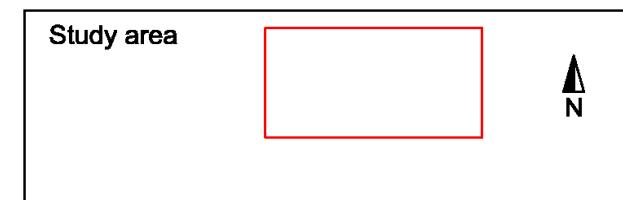


FIGURE 1

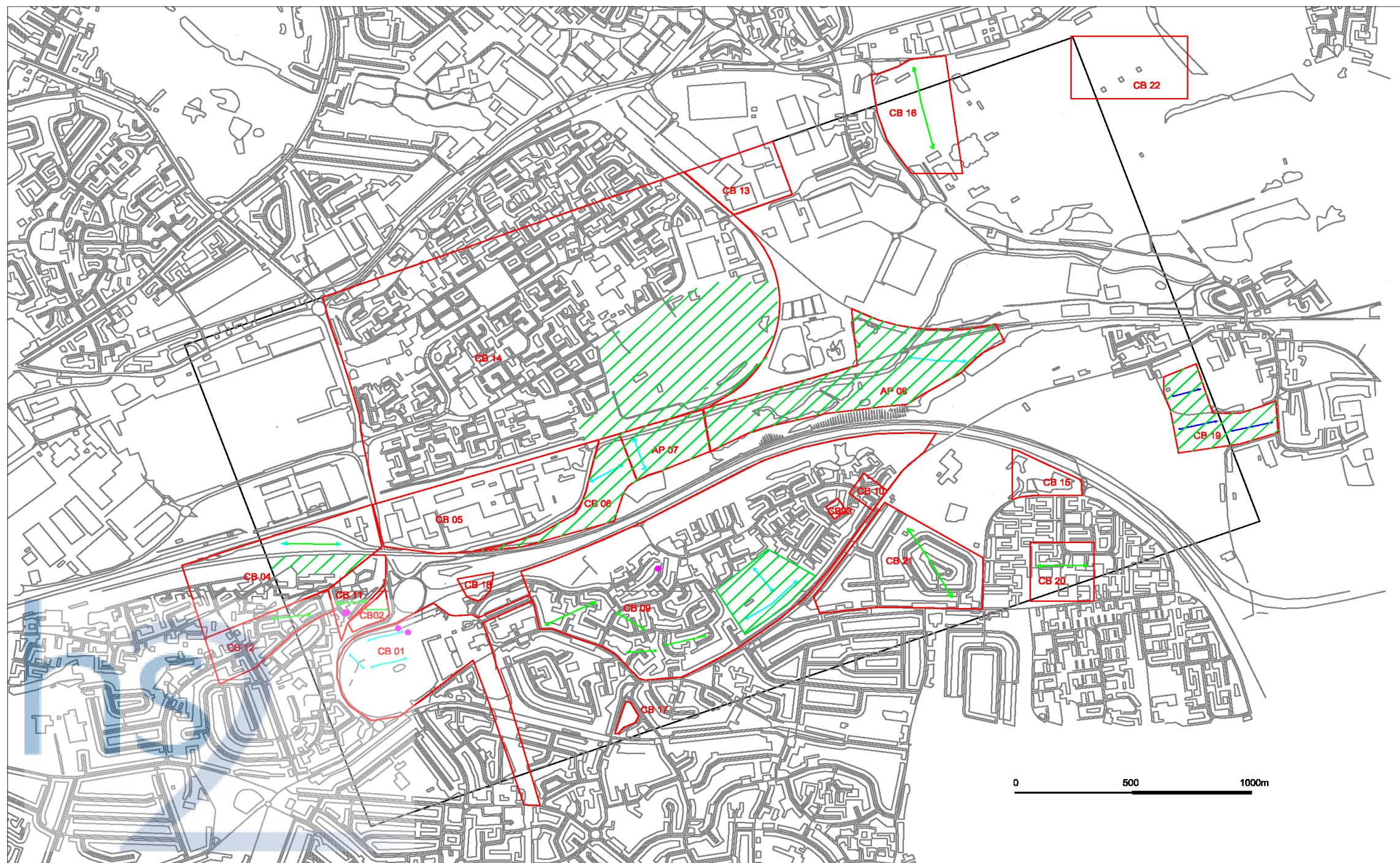


Figure 2 Sites Recorded from Aerial Photographs

Legend

Study area	—	Destroyed ridge and furrow	—
AP Site	—	Extant ridge and furrow	—
Eroded ridge and furrow	—	Former bomb crater	—
		Area of moderate significance where features may be extant	///
	N		

FIGURE 2

Figure 10: Aerial photographic survey - sites recorded from aerial photographs

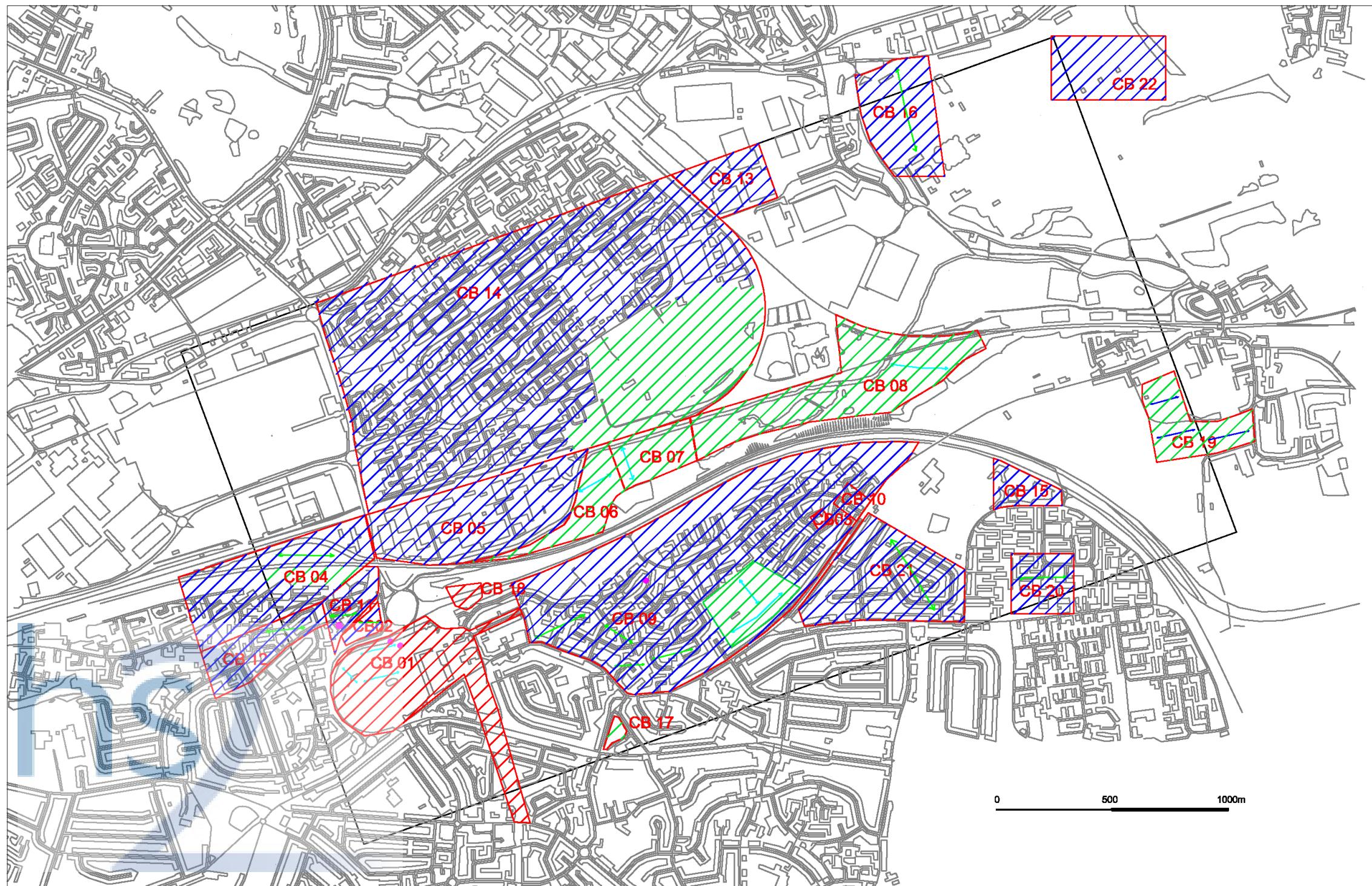


Figure 3 Significance of Sites Recorded from Aerial Photographs

Legend

Study area	—	Area of low or no significance where features are likely to be destroyed	
AP Site	—	Area of moderate significance where features may be extant	
	▲	Area of high significance where features are extant	

FIGURE 3